REMARKS

Upon entry of this amendment, claims 1 - 12 and 25 – 43 will be pending in the application. Claims 1, 6, 7, 12, 28, 32, 34 - 37 are being amended, claims 38 to 43 are being added, and claims 23 and 24 are being cancelled.

The claim amendments and added claims are fully supported by the Specification and original claims and add no new matter. For example, claims 1 and 7 are being amended to state that the substrate processing chamber component structure comprises a metal, and this language is supported at least by the Specification, at page 12, lines 15-16. Claims 1 and 17 are also being amended to recite that the coating comprises a thickness having a gradually changing concentration of yttrium-containing species therethrough, and this is supported at least by original claim 6. The previously entered amendments to claims 1 and 7, relating to the electroplated coating process parameters, are now being entirely withdrawn along with the arguments previously made..

Claims 6, 12 and 32 are being amended to recite that the electroplated coating comprises a thickness having a gradually changing concentration of aluminum-containing species therethrough. This is supported by the Specification, at page 14, line 26 to page 15, line 10.

The amendments to claim 34 and 36 are supported by the Specification at least at page 9, line 16 to page 10, line 12.

Claims 35 and 37 are being amended to recite that the alloy comprises an aluminum alloy, and this language is supported by the Specification, at page 12, lines 15-16.

The Examiner objected to claims 11 and 32 as being dependent upon a rejected base claim, but indicated that these claims would be allowable if rewritten in independent form.

Amended claim 28 now includes the language of objected to claim 32, which the Examiner indicated as objected to but deemed allowable if rewritten in independent form. Thus, claim 28 should now be allowable.

Newly added claim 41 is a combination of originally presented claim 7 and objected to claim 11. Previously added claim limitations are now being removed in their entirety. This claim is being added because claim 11 was objected to but deemed allowable if rewritten in independent form. Thus, claim 41 should now be allowable.

Newly added claim 38 is based on originally presented claim 1 and further recites that the electroplated coating comprises (i) yttrium-containing species, (ii) aluminum-containing species, and (iii) zirconium-containing species.

Thus, no new matter is being added, and entry of the claim amendments and added claims is respectfully requested.

Claim Objections and Section 112 Rejections

Claims 35 and 37 were objected to under 37 C.F.R. § 1.75(c), and were rejected under section 112, second paragraph.

Claims 35 and 37 are being amended to recite "metal comprises an alloy", and this amendment should address the present objections and rejection as the objected-to language is being deleted.

Rejections

1. Claims 1-4, 6, 23-27 and 34-37 were rejected under 35 U.S.C. § 102(b) as anticipated by, or in the alternative, under 35 USC §103(a) as obvious over, Morita et al. (USPA 2002/0012791).

To anticipate a reference, each and every element of the claim must be disclosed by a single prior art reference. W.L. Gore & Assocs. V. Garlock, Inc., (Fed Cir. 1983), cert. denied, 469 U.S. 851 (1984).

As amended, claim 1 reads on a substrate processing chamber component capable of being exposed to a plasma in a process chamber, the component comprising: (a) a substrate processing chamber component structure comprising a metal; and (b) an electroplated coating on the substrate processing chamber component structure, the electroplated coating comprising a thickness having a gradually changing concentration of yttrium-containing species therethrough.

Applicant respectfully submits that Morita et al. does not anticipate amended claim 1 because Morita et al. does not teach each and every element of claim 1. First, Morita et al. does not teach a component structure comprising a metal. Morita et al. teaches an underlying structure comprising a ceramic material consisting of a sintered body of alumina (aluminum oxide) which is then coated with a layer of yttrium aluminum garnet. For example, Morita et al. teaches:

> "The first aspect of this invention is a ceramic material characterized by comprising a base material substantially made of a sintered body of alumina and a yttrium-aluminum-garnet (YAG) layer having a thickness of 2 μm or more, which is formed on the surface of the base material." Page 1, paragraph 0013.

Thus, Morita et al. teaches a base material comprising a sintered body of alumina, which is a ceramic body, and consequently, Morita et al. does not teach a component structure comprising a metal, as claimed in claim 1.

Thus, Morita et al. does not teach each and every element of claim 1, and consequently, does not anticipate claim 1 or the claims dependent therefrom.

Furthermore, claim 1 is not obvious over Morita et al. because Morita et al. does not teach or suggest a component structure comprising a metal, and further does not motivate applying a coating over a body of metal. Morita et al. teaches applying a YAG coating on a sintered ceramic body to increase the mechanical strength of the underlying ceramic body. Morita et al. teaches "...the sintered body of YAG is excellent in the plasma resistance, but inferior in the mechanical properties such as bending strength and breakage toughness." (Page 1, paragraph 0011.) Morita et al. further teaches that applying a YAG coating on the sintered body of the ceramic structure improves the mechanical properties of the sintered body. (paragraph 0012.) Thus, Morita et al. solves a problem of weak mechanical strength of an underlying ceramic structure by applying a sintered YAG coating on the ceramic structure. However, neither the problem solved by Morita et al. or the solution to the problem, apply to a component structure comprising a metal as claimed. Unlike the ceramic taught by Morita et al., most metals are not weak in mechanical properties such as bending strength and breakage toughness. Thus, the teachings of Morita et al. would not motivate applying a coating to an underlying structure comprising a metal, as claimed. Consequently, Morita et al. does not teach or suggest the present claim, and therefore, Morita et al. does not render obvious claim 1, or the claims dependent therefrom.

2. Claims 1-4, 7-10, 25-27 and 34-37 were rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over, Murakawa et al. (USP 6,447,937).

Applicant respectfully submits that Murakawa et al. does not anticipate amended claim 1 or 7 because Murakawa et al. does not teach each and every element of these claims. Specifically, Murakawa et al. does not teach a substrate processing chamber component structure comprising a metal, and which has an electroplated coating comprising yttrium-containing species. Instead, Murakawa et al. teaches a

member formed from a sintered body of elements from Group IIIa, such as a sintered body of yttrium-aluminum-garnet. (Abstract). The sintered body taught by Murakawa et al. is a ceramic body, and not a component structure comprising a metal.

In addition, Murakawa et al. also does not teach an electroplated coating comprising a thickness having a gradually changing concentration of yttrium-containing species therethrough, as claimed in claims 1 and 7. Instead Murakawa et al. teaches a sintered body of YAG, or a layer on a sintered body. (Col. 6 lines 11-16.)

Thus, Murakawa et al. does not anticipate claims 1 or 7, or the claims dependent therefrom.

Claims 1 and 7 are also not obvious over Murakawa et al. because Murakawa et al. also does not teach or suggest a substrate processing chamber component structure comprising a metal or alloy, and which has an electroplated coating thereon. Instead, Murakawa et al. teaches that "[t]he ceramic material of the present invention, although used to form a member or a portion thereof that is exposed to the plasma halogen-containing gas, can be made of a ceramics comprising an [sic] composite oxide of metals, including a metal of Group IIIa of Periodic Table and metal Al and/or Si." Column 5, lines 9-21. Thus, Murakawa et al. teaches a ceramic material, and not a underlying structure comprising a metal.

Murakawa et al. also does not teach an electroplated coating on a chamber component structure, which comprises an interface having a thickness with a gradually changing concentration of yttrium-containing species therethrough. Murakawa et al. does not teach or suggest the advantages of providing a coating that is better bonded to, and integral with the underlying structure, due to the interface produced by the electroplated coating. Consequently, the electroplated coating and the resultant interface also distinguishes the Murakawa et al..

For these reasons, Murakawa et al. does not render obvious claims 1 or 7, or the claims dependent therefrom.

3. Claims 1-2, 7-8 and 34-37 were rejected under 35 U.S.C. 102(a and e) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over, O'Donnell et al. (USPA 2004/0002221).

Applicant respectfully submits that O'Donnell et al. does not anticipate amended claim 1 or 7 because O'Donnell et al. does not teach each and every element of these claims.

As acknowledged by the Office Action, O'Donnell et al. does not teach a structure comprising an electroplated coating as claimed. However, the Office Action further states:

> Moreover, the Specification teaches that conventional coatings are disfavored because they result in the formation of a discrete interface. ... However, avoidance of such an interface is not claimed. Not all electroplating regimes would be expected to necessarily result in avoidance of discrete interface. It is unclear that other structural or compositional features are achieved by the claimed product-by-process limitations that can distinguish over the prior art.

In a response to the Office Action's comments, claim 1 is being amended to recite that the an electroplated coating on the component, comprises an interface having a thickness with a gradually changing concentration of yttrium-containing species therethrough. Thus, claim 1 now provides language that describes the interface produced by the electroplated coating.

O'Donnell et al. does not teach an electroplated coating comprising a thickness having a gradually changing concentration of yttrium-containing species therethrough, as claimed in claims 1 and 7. Instead O'Donnell et al. teaches a thermal sprayed coating consisting essential of yttria. (Para 0027 and 0038.) Thus, O'Donnell et al. does not anticipate claims 1, 2, 7, 8, and 34-37.

Claims 1 and 7 are also not obvious over O'Donnell et al. because O'Donnell et al. also does not teach or suggest a chamber component structure comprising an electroplated coating thereon with a thickness having a gradually changing concentration of yttrium-containing species, or the advantages obtained therefrom. Instead, O'Donnell et al. teaches a thermal sprayed yttrium coating which does not contain a compositional gradient of yttrium-containing species. O'Donnell et al. also does not teach or suggest the advantages of, and thus does not motivate fabrication of, an electroplated coating comprising a thickness having a gradually changing concentration of yttrium-containing species therethrough. O'Donnell et al. does not teach the advantages of providing a coating that is better bonded to, and integral with, the underlying structure due to its compositional gradient through a thickness. Thus, O'Donnell et al. does not render obvious claims 1 or 7, or the claims dependent therefrom.

4. Claims 1-5, 25-31 and 33-37 were rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over, Takeuchi et al. Abstract (JP 11-229142).

Applicant respectfully submits that the Takeuchi et al. Abstract does not anticipate amended claim 1 because the Takeuchi et al. Abstract does not teach each and every element of claim 1. As amended, claim 1 is to a component comprising "a substrate processing chamber component structure". Takeuchi et al. Abstract does not teach a substrate processing component but instead teaches an LSM tube. The claimed substrate processing chamber component structure has a configuration adapted for a substrate processing chamber. The LSM tube is a structure that appears to be used in an electrical fuel cell application and consequently is not a substrate processing chamber component. Thus, the claimed "substrate processing chamber component structure" is not anticipated by the LSM tube taught by Takeuchi et al. Abstract.

Further, the Takeuchi et al. Abstract does not teach a substrate

processing chamber component structure comprising a metal, and instead teaches a member formed from a sintered body of elements from Group IIIa, such as a sintered body of yttrium-aluminum-garnet. The sintered body taught by the Takeuchi et al. Abstract is a ceramic body, and not a component structure comprising a metal or alloy as claimed.

Furthermore, the Takeuchi et al. Abstract also does not teach the structural element comprising an electroplated coating comprising a thickness having a gradually changing concentration of yttrium-containing species therethrough, as claimed in claims 1 and 7. Instead the Takeuchi et al. Abstract teaches a sintered body of YAG, or a layer on a sintered body which does not have a gradually changing compositional gradient. (Col. 6 lines 11-16.)

Thus, the Takeuchi et al. Abstract does not anticipate claim 1 or the claims dependent therefrom.

Claim 1 is also not obvious over the Takeuchi et al. Abstract because the Takeuchi et al. Abstract does not motivate forming a yttrium containing coating on a substrate processing component but instead forming such a coating on an LSM tube which is used in the entirely different, and non-analogous art, of electrical fuel cells. The Takeuchi et al. Abstract also does not teach an electroplated coating comprising a thickness having a gradually changing concentration of yttrium-containing species therethrough as claimed. Instead the Takeuchi et al. Abstract teaches a sintered body of YAG, or a layer on a sintered body, which does not have a gradually changing concentration of yttrium-containing species therethrough. (Col. 6 lines 11-16.) For these reasons, Takeuchi et al. does not teach or render obvious claim 1 or the claims dependent therefrom.

Amended independent claim 28 now includes the language of objected to claim 32, and thus, claim 28 and the claims dependent therefrom, should also be allowable over Taeuchi et al..

5. Claims 1-4, 7-10, 25-27 and 34-37 were rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over, Otsuki (USPA 2001/003271).

Applicant respectfully submits that Otsuki does not anticipate amended claim 1 or 7 because Otsuki does not teach a structure comprising an electroplated coating comprising a thickness having a gradually changing concentration of yttrium-containing species therethrough, as claimed in claims 1 and 7. Thus, Otsuki does not anticipate claims 1, 2, 7, 8, and 34-37.

Claims 1 and 7 are also not obvious over Otsuki because Otsuki also does not teach or suggest a chamber component structure comprising an electroplated coating with a gradually changing concentration of yttrium-containing species, or the advantages therefrom. Instead, Otsuki teaches a thermal sprayed coating and does not teach or suggest a gradient of yttrium-containing species in the coating. Otsuki also does not teach or suggest the advantages of, and thus does not motivate, an electroplated coating comprising a thickness having a gradually changing concentration of yttrium-containing species therethrough.

For these reasons, claims 1-4, 7-10, and 25-27 are not obvious over Otsuki et al..

Rejection Under 35 U.S.C. § 103

Claims 7-10 and 12 were also separately rejected under 35 USC §103(a) as obvious over, Morita et al. (USPA 2002/0012791).

Morita et al. does not teach a substrate processing chamber component structure comprising a metal, and which has an electroplated coating comprising yttrium-containing species thereon, as recited in claim 7. Instead, Morita et al. teaches an underlying structure comprising a ceramic material comprising a sintered body of alumina (aluminum oxide) coated with a layer of yttrium aluminum garnet. [Page 1, paragraph 0013.] A sintered body of alumina is a ceramic body and not a metal, as claimed in claim 7. Further, Morita et al. teaches that while the sintered body is excellent in the plasma resistance, it is inferior in mechanical properties such as bending strength and breakage toughness. Morita et al. then teaches that applying a YAG coating on the sintered body of the ceramic structure provides better mechanical properties. Thus, Morita et al. solves a problem of breakage of an underlying ceramic structure by applying a YAG coating. Consequently, Morita et al. does not motivate applying a yttrium containing coating to an underlying metal structure as claimed because metals are typically not brittle like ceramics. For these reasons, claim 7 and the claims dependent therefrom, are not obvious over Morita et al..

The above-discussed amendments are believed to place the present application in condition for allowance. Should the Examiner have any questions regarding the above remarks, the Examiner is requested to telephone Applicant's representative at the number listed below.

Respectfully submitted,
JANAH & ASSOCIATES, P.C.

Date: July 10th, 2007 By: _____

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